DOCUMENT RESUME

ED 208 253 CE 030 415

AUTHOR Newhouse, Joseph P.; And Others
TITLE How Sophisticated Are Consumers About the Medical Care Delivery System? Rand Health Insurance Experiment Series.
INSTITUTION Rand Corp., Santa Monica, Calif.
SPONS AGENCY Department of Health and Human Services, Washington, D.C.
REPORT NO ISBN-0-8330-0320-8; Rand-R-2693-HHS
PUB DATE Apr 81
GRANT DHHS-18-P-97122/9-03
NOTE 32p.

EDRS PRICE MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS Consumer Economics; *Consumer Education; *Delivery Systems; *Medical Services; *Questionnaires; Research; *Test Reliability; *Test Validity

ABSTRACT

A study was conducted to obtain information about the extent of consumer knowledge of the medical care delivery system and to derive a scale to measure it. A 10-item questionnaire was administered to 4976 persons aged 14-66 in Ohio, Massachusetts, South Carolina, and Washington to measure their consumer sophistication. Some items assessed extent of consumer knowledge related to choosing providers. Others assessed consumer knowledge related to use of medical services for a particular problem. Four stages of analyses identified differences across content areas and across study sites, tested appropriateness of constructing a multi-item summary measure of consumer sophistication, examined reliability and validity of an eight-item scale, and performed regressions to describe population differences in consumer sophistication. Analyses of individual items suggested that consumers are knowledgeable about some matters and uninformed about others. Efforts at educating consumers about board certification, staff privileges, and other information pertinent to choosing a regular source of care seemed warranted. Factor analyses indicated that a substantial amount of the information contained in item responses can be summarized in a multi-item scale score. The reliability and validity of the scale as a measure of patient sophistication was supported. (YLB)

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How Sophisticated Are Consumers About the Medical Care Delivery System?

Joseph P. Newhouse, John E. Ware, Jr., Cathy A. Donald

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The research reported herein was performed pursuant to Grant No. 18-P-97122/9-03 from the U.S. Department of Health and Human Services, Washington, D.C. The opinions and conclusions expressed herein are solely those of the authors, and should not be construed as representing the opinions or policy of any agency of the United States Government.

Library of Congress Cataloging in Publication Data

Newhouse, Joseph P.
How sophisticated are consumers about the medical care delivery system?

"R-2693-HHS."
Bibliography: p.
1. Medical care--United States--Public opinion. 2. Public opinion--United States. I. Ware, John E., 1942- . II. Donald, Cathy A., 1947- . III. United States. Dept. of Health and Human Services. IV. Rand Corporation. V. Title. [DNLM: 1. Delivery of health care--United States. 2. Consumer participation. W 84 AA1 N5h]
RA395.A3N48 362.1'0973 81-7322
ISBN 0-8330-0320-8 AACR2

The Rand Publication Series: The Report is the principal publication documenting and transmitting Rand's major research findings and final research results. The Rand Note reports other outputs of sponsored research for general distribution. Publications of The Rand Corporation do not necessarily reflect the opinions or policies of the sponsors of Rand research.

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R-2693-HHS

How Sophisticated Are Consumers About the Medical Care Delivery System?

Joseph P. Newhouse, John E. Ware, Jr.,
Cathy A. Donald

April 1981

Prepared under a grant from the
U.S. Department of Health and Human Services.

Rand
SANTA MONICA, CA. 90406

PREFACE

For many years public policy toward medical services has generally reflected the view that consumers know little about medical care. Recently, a number of proposals have appeared that would increase the role of consumer choice in the allocation of medical care resources. One of the objections to these proposals is consumer ignorance. Although this issue has been widely discussed, little factual information is available.

This report's goals were to obtain information about the extent of consumer knowledge of the medical care delivery system and to derive a scale that would permit its measurement. A forthcoming companion study reports on consumer knowledge of health insurance coverage. Both studies use data collected as part of Rand's Health Insurance Study. Preparation of analytical data files and the analysis were supported by a grant from the Health Care Financing Administration, U.S. Department of Health and Human Services.

The substance of this report was published in the March 1981 issue of *Medical Care*; this version of the report includes some editorial revisions.

SUMMARY

A ten-item questionnaire was administered to nonaged persons (N = 4976) to measure their sophistication or knowledgeability about the medical care delivery system. Such sophistication seems germane to views about the appropriate role consumers might play in decisions affecting resource allocation, especially whether competition and/or cost-sharing strategies should be pursued or whether regulatory strategies are more promising.

Analyses of individual items suggest that consumers are knowledgeable about some matters and uninformed about others. If a procompetitive strategy is pursued, efforts at educating consumers about board certification, staff privileges, and other information pertinent to choosing a regular source of care seem warranted.

Factor analyses indicated that a substantial amount of the information contained in item responses can be summarized in a multi-item scale score. The reliability and validity of this scale as a measure of patient sophistication was supported.

ACKNOWLEDGMENTS

The author would like to thank David Kanouse for helpful comments on an earlier draft and George Goldberg, M.D., for assistance in developing the items. Neither should be held responsible for any remaining problems.

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I. INTRODUCTION

One can distinguish at least three positions in the current debate over the financing of medical care services. A traditional position maintains that most patients should pay for most medical services, and that health insurance should only serve to protect consumers against catastrophic financial losses. Some of those espousing this position advocate national health insurance plans with income-related cost sharing (Feldstein, 1971; Seidman, in press). A second, quite different position argues that because medical care is a right, patients should not have to pay at all for medical services. With medical care free at the time of use, the public sector should either extensively regulate or actually produce medical care services (Detsky, 1978; Evans, 1975; Fein, 1975). A third, more recent position argues for competition among organized providers of medical services partially on the basis of price (Ellwood, 1978; Enthoven, 1978, 1980; Havighurst, 1978; Newhouse and Taylor, 1971). Expansion of health maintenance organizations is one example of this strategy.

Many points are at issue among those advocating these various positions. One rather fundamental point, however, is whether the consumer is able to make wise choices about the use of medical care services. Those advocating extensive regulation portray the consumer as ill-informed and readily influenced by the physician, who need not have the consumer's best interest at heart. Those advocating cost sharing or competition among organized systems concede that the consumer will not always make wise choices, but suggest that on balance the consumer does better than a regulator. Those advocating competition among organized systems also argue that a competition strategy is preferable to cost sharing, because it requires consumers to choose a provider when well, rather than a mode of treatment when sick.

OBJECTIVE OF THE PRESENT STUDY

The objective of the present study was to obtain some evidence about the consumer's ability to make good choices. On the assumption that more knowledgeable or more sophisticated consumers are in a position to make better choices, we have sought to measure consumer sophistication about the delivery system.

Specifically, we address two distinct but related issues. First, we

have sought to measure a general construct that we call consumer sophistication. The issue is whether a reliable and valid multi-item summary scale of sophistication can be constructed. Second, we analyze responses to ten questionnaire items, eight of which enter the scale for consumer sophistication. Some items assess the extent of consumer knowledge of facts related to choosing providers (e.g., certified versus noncertified physicians); other items assess the consumer's knowledge about facts related to the use of medical services for a particular problem (e.g., whether to seek a second opinion). Knowledge pertaining to the choice of providers is more relevant to a strategy emphasizing competition among providers; knowledge about use of services is more relevant to a cost-sharing strategy.

PREVIOUS WORK

Although previous studies (Reeder and Berkanovic, 1973; Suchman, 1964, 1965) have measured consumer knowledge of various disease processes, little is known about consumer sophistication concerning the medical care delivery system. Pauly (1978) provided a stimulating conceptual discussion of the issues, pointing out how little empirical information is available. Bunker and Brown's (1974) study of surgery provides an inference about the sophistication of certain individuals. Bunker and Brown assessed the extent of possible excess surgery by comparing the rates of surgeries performed on a group of Stanford Medical School faculty and their spouses with those performed on groups of attorneys, Protestant ministers, and graduates of Stanford Business School and their spouses. These investigators reasoned that medical school faculty, as informed consumers, would be less likely to permit unnecessary surgery to be performed on themselves or their families than would attorneys, ministers, and businessmen—groups chosen to be comparable in socioeconomic status, education, and health problems, but thought to be lacking in specific medical knowledge. The results showed that the rates of surgeries performed on medical school faculty were similar to those performed on the other groups, and their spouses had even higher rates; the differences among the spouses were often statistically significant. When compared with the population at large, physicians and their spouses had higher rates of appendectomies and hysterectomies.

The inference we draw from this study is that all the comparison groups were sufficiently well-informed to render the amount of surgery without appropriate indications, if any, unmeasurable. (We assume, like the authors, that the medical school faculty are informed consum-

ers.) Thus, we infer that there are some well-informed lay consumers. But one would anticipate that the comparison groups used in this study would be among the best-informed consumers. It remains possible that surgery rates might have differed substantially between the medical school faculty and a less well-informed, but otherwise comparable, group. The difficulty of identifying other groups that are comparable except for information, however, argues for a direct measure of knowledge, as we pursue below.

Other studies are less closely related to our goal. Fabrega and Roberts (1972), in a study of disadvantaged urban blacks, measured knowledge of medical care resources by asking questions about the name and location of specific facilities. A weak trend suggested that users of services may be more knowledgeable than nonusers. But knowledge of location is not the same as sophistication. Other factors (e.g., education) that should relate to consumer sophistication were not analyzed.

Becker and others (1972) measured knowledge of prescriptions and follow-up appointments in a study of mothers' compliance with pediatric regimens. Knowledge scores were significantly higher for more educated mothers but were unrelated to other sociodemographic variables. Knowledge scores were also significantly higher for those reporting greater continuity of care and were positively related to perceived severity of illness, worry about health, and belief in the medical diagnosis of the problem. In a later report of this study, substantial associations among knowledge items were reported in support of the notion that a general factor defining knowledge of treatment may be measurable (Becker et al., 1974). But knowledge of one's own (or one's child's) health problems and treatment regimens is, also, somewhat different from general knowledge or sophistication about the medical care delivery system, which we seek to measure.

II. METHODS

SAMPLE CHARACTERISTICS AND DATA-GATHERING METHODS

Data were gathered by using a questionnaire that was self-administered at the beginning (three sites) or end (one site) of the Health Insurance Study (Newhouse, 1974). Results reported here were based on 4976 people between the ages of 14 and 66 sampled from four geographic regions in Ohio, Massachusetts, South Carolina, and Washington. The Ohio and Washington areas included the metropolitan areas of Dayton and Seattle, respectively. The South Carolina sample included metropolitan Charleston and a nonmetropolitan area, Georgetown County. The Massachusetts area included metropolitan Fitchburg and a nonmetropolitan area, Franklin County. Additional details regarding sampling are reported elsewhere (Ware et al., 1980).

A summary of the characteristics of respondents in each site and in all sites combined is given in Table 1. The samples differed (intentionally) from the populations in those areas because participation in the Health Insurance Study was restricted to families with at least one head of household 61 or under and with a family income of $25,000 or less (in 1973 dollars). Low-income families were slightly oversampled in sites other than Seattle, and in Seattle, the membership of Group Health Cooperative of Puget Sound was somewhat oversampled. People in institutions, in the military, and who were receiving care for service-connected disabilities in Veterans Administration hospitals were excluded.

A ten-item questionnaire was drawn up to measure consumer knowledge or sophistication (Table 2). Response choices of "Agree," "Disagree," and "Don't Know" were printed below each item. Whether "Agree" or "Disagree" counted as the correct response was determined independently of the data and is given for each item in the footnote to Table 2.

PLAN OF ANALYSIS

The analyses were performed in four stages. First, responses to each of the ten questionnaire items were analyzed to identify differences in consumer sophistication across content areas (items) and across the four study sites. Second, correlations among the items were factor

Table 1

Summary of Sociodemographic Information for Study Participants in Four Health Insurance Study Sites and in All Sites Combined

Site[a]	N	Percent Male	Percent Nonwhite	Age		Years of Schooling Completed		Family Income[b]	
				Range	Mean	Range	Mean	Range	Mean
Seattle, Washington	2235	47	6	14-61	31.8	2-25	12.9	0-27,640	13,251
Fitchburg/Franklin County, Massachusetts	1068	46	2	14-66	32.5	2-22	12.4	0-27,400	12,216
Charleston/Georgetown County, South Carolina	1300	44	45	14-59	31.0	0-27	11.3	0-30,200	11,036
Dayton, Ohio	373	46	10	14-64	35.8	3-24	12.6	0-55,893	14,380
All Sites Combined	4976	46	16	14-66	32.0	0-27	12.4	0-55,893	12,535

[a] All information is based on data gathered at enrollment except for Dayton, where interviews were conducted for persons completing the study after 3 years.

[b] Incomes were estimated for 1974 in Massachusetts and Washington and for 1975 and 1976 in South Carolina and Ohio, respectively.

Table 2

Consumer Sophistication Items

Item Content
A. Some operations done by surgeons are not really necessary.
B. If you have doubts about your own doctor's advice, it's a good idea to get another doctor's opinion.
C. Stomachaches and headaches are hardly ever caused by your emotions.
D. A medicine prescribed by a doctor can have very different prices, depending on whether or not it has a brand name.
E. If you have to go into the hospital, your doctor can get you admitted to any hospital you prefer.
F. You may be able to tell how good a doctor is by finding out if he is certified by a special board.
G. If you have a particular medical problem, there is usually a doctor specially trained to handle it.
H. Doctors are checked every few years, before their licenses are renewed.
I. For many illnesses, doctors just don't have any cure.
J. Two doctors who are equally good at their job may still suggest very different ways of treating the same illness.

NOTE: Response codes for all items are: Agree, Disagree, Don't Know.

Correct answers are: Agree, Items A, B, D, F, G, I, J; Disagree, Items C, E, H.

analyzed to test the appropriateness of constructing a multi-item summary measure of consumer sophistication. Third, the reliability and validity of an eight-item scale were examined. Finally, individual items and the multi-item scale were regressed on sociodemographic characteristics of respondents and on two estimates of medical care consumption. The regressions were performed to describe population differences in consumer sophistication, taking correlations among background (predictor) variables into account. Details of each step in the analysis are briefly summarized below.

In analyzing responses to individual items, individual observations were weighted to make them representative of the eligible population in each site.[1] Reported item frequency distributions were based on samples weighted by family size and income to take into account oversampling of low-income groups and undersampling of middle-income groups in some sites. Although some site differences were observed (as noted in the discussion of results), major trends were consistent across sites and therefore we focus on the analysis of the weighted combined sample.

A factor analysis of ten items was performed independently in each site and in all sites combined, using the principal components method (Harman, 1976). Results were similar across sites and, hence, only the findings from the combined-sites analysis are summarized in this report.

Eight items (A-E, H-J) correlated substantially with the first unrotated component. These items were used to create a consumer sophistication summary scale consisting of the simple sum of correct responses (i.e., scores ranged from 0-8). Item-total correlations were computed to test whether correlations were all significant and positive, as required by this scoring method. The reliability of the summary scale score was estimated by using Cronbach's (1951) Alpha coefficient.

Preliminary tests of validity for items and for the eight-item summary score were performed by correlating them with education and ten other measures: (a) a 9-item rating of current health (Ware et al., 1978); (b) a 38-item mental health index (Ware et al., 1979); (c) two multi-item estimates of acquiescent and opposition response sets (tendencies to endorse or negate items, respectively, regardless of content) (Ware, 1978); (d) an 8-item measure of socially desirable response set (Ware et al., 1978); (e) two 4-item measures of belief in provider and personal

[1]Through an oversight, our analysis generally does not correct the oversampling of Group Health Cooperative of Puget Sound. Approximately 25 percent of our Seattle sample was enrolled in Group Health Cooperative prior to the experiment, whereas only 15 percent of Seattle area residents belonged to the Cooperative. But examination of item frequency distributions corrected for the oversampling showed minimal changes. Thus, we did not think it worthwhile to correct the other results for this oversampling.

control over health outcome (Lau and Ware, 1981); (f) a two-item measure of attitude toward going to the doctor (Ware et al., 1978); (g) a two-item measure of satisfaction with the quality of medical care;[2] and (h) the number of medical care visits during the prior year. We hypothesized that a valid measure of consumer sophistication regarding medical care services would correlate significantly and positively with education and prior use of services, would not correlate with any of the three response set measures, and would correlate very weakly, if at all, with beliefs and attitudes regarding medical care providers and personal control over health outcomes. The positive correlations were hypothesized because people who are more educated or who have more contact with the medical care system should be more knowledgeable about medical care services.

Each of the eight items selected for further study and the summary scale were regressed on age, education, income, race, sex, and two estimates of the use of health care services during the prior year (whether one or more visits were reported and the inverse of the number of visits for those with positive visits, one if zero visits).[3] Income was included as a descriptive measure, although there was little or no theoretical reason for it to affect sophistication (after controlling for education and use of services). Indeed, the income variable bore no significant relationship to any of the sophistication measures; therefore we report only regression results using physician visits, age, education, race, and sex as explanatory variables.

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[2]The two quality-of-care rating items asked about whether doctors take enough time to find out what is wrong with their patients and whether doctors and other providers are friendly and helpful and seem to care.

[3]The inverse transformation was selected because it caused residuals in a regression equation explaining expenditure to be homoscedastic. Use of a simple visit measure led to overfitting the few individuals with extremely high numbers of visits, and there was reason to think this would happen with these eight items as well.

III. RESULTS

PATTERN OF RESPONSES ON PARTICULAR ITEMS

The pattern of responses was similar across sites for each item but varied substantially across items (Table 3). Well over half the respondents gave the correct answer to five items (B, C, D, G, J); roughly half gave the correct answer to two items (A, I); well under half gave the correct response to three items (E, F, H). Thus, the raw responses suggested that most individuals had a modicum of knowledge, whereas only few knew enough to answer all items correctly.

FACTOR ANALYSIS AND SCALE DEVELOPMENT

One large general factor accounted for about one-fourth of the total measured variance. Eight of the ten items had substantial loadings (ranging from 0.40 to 0.60) on this factor, but two items (F and G) had low loadings (.12 to .31). Because items F and G also failed tests of validity (see below), they were eliminated from the scale; the remaining eight items were combined to form a scale of consumer sophistication.

The only ambiguity in scoring was treatment of "Don't Know" responses. Reliability was greatest when such responses were scored as incorrect. Using this scoring method, the median item-scale correlation (corrected for overlap) ranged from 0.28 to 0.35 within sites and was 0.34 for all sites combined (Table 4). These results suggest that the item responses contain a considerable amount of error as measures of sophistication and that analyses of individual items may not be precise enough to detect some true group differences in sophistication. The eight-item summary scale achieved a much higher level of reliability, ranging from 0.60 to 0.64 within sites, and was 0.64 in the combined sites analysis (Table 4). Addition of one or both of the two rejected items (F and G) lowered the reliability of the summary scale score in all sites.

Scale Validity

The general pattern of correlations between the validity variables on the one hand, and the items and summary scale on the other, supports the validity of the latter as measures of consumer sophistication (Table 5). Product-moment correlations between educational level and the eight selected patient sophistication items were all significant and

Table 3

PERCENTAGE OF CORRECT, DON'T KNOW, AND INCORRECT RESPONSES FOR TEN CONSUMER SOPHISTICATION ITEMS, FOUR SITES[a]

Abbreviated Item Content/Size[b]	Correct	Don't Know	Incorrect
A. Unnecessary Surgery			
D	55.5	36.7	7.7
S	56.8	36.6	6.6
M	52.2	38.8	8.9
SC	46.9	42.2	10.9
B. Another Opinion			
D	94.2	3.1	2.7
S	95.2	2.9	1.9
M	94.7	3.0	2.3
SC	88.2	7.2	4.6
C. Emotional Causes			
D	76.8	17.2	6.0
S	83.0	11.9	5.1
M	77.8	15.5	6.7
SC	62.6	25.8	11.5
D. Medicine Prices			
D	69.3	28.9	1.8
S	70.2	26.5	3.3
M	71.8	25.5	2.7
SC	63.0	32.9	4.1
E. Hospital Privileges			
D	31.3	43.3	25.4
S	37.5	46.3	16.2
M	19.9	46.8	33.4
SC	21.0	41.3	37.7
F. Specialty Board			
D	22.2	54.8	23.0
S	17.6	55.2	27.2
M	19.3	56.6	24.1
SC	28.0	48.7	23.4
G. Specialty Training			
D	89.8	7.9	2.3
S	92.3	5.7	1.9
M	93.3	5.0	1.7
SC	84.2	11.7	4.1

Table 3—continued

Abbreviated Item Content/Size[b]	Correct	Don't Know	Incorrect
H. License Renewals			
D	17.3	74.7	8.0
S	20.1	72.5	7.5
M	18.0	71.0	11.0
SC	8.7	72.7	18.6
I. Lack of Cures			
D	63.5	26.8	9.7
S	63.4	25.1	11.5
M	63.4	25.3	11.4
SC	60.2	29.0	10.8
J. Different Treatments			
D	81.7	17.1	1.1
S	79.2	17.4	3.4
M	79.6	17.3	3.0
SC	74.0	21.0	5.0

[a]Responses in Dayton, Massachusetts, and South Carolina have been weighted to adjust for oversampling of low income persons. Seattle responses throughout have not been weighted to adjust for oversampling of Group Health members.

[b]D - Dayton, Ohio; S - Seattle, Washington; M - Fitchburg/Franklin County, Massachusetts; SC - Charleston/Georgetown County, South Carolina.

Table 4

DESCRIPTIVE STATISTICS, ITEM-SCALE CORRELATIONS, AND RELIABILITY ESTIMATES, FOUR SITES AND ALL SITES COMBINED

Sites	N[a]	Mean	Standard Deviation	Median Item-Scale Correlation[b]	Reliability Estimate
Dayton	370	4.91	1.80	.33	.64
Seattle	1605	4.98	1.77	.35	.64
Fitchburg/ Franklin County	1066	4.76	1.74	.34	.62
Charleston/ Georgetown County	1295	4.19	1.78	.28	.60
All Sites Combined	4962	4.75	1.82	.34	.64

[a]N's for each site differ from those in Table 1 because of fourteen cases with missing data. Additionally, those already enrolled in the Group Health Cooperative and 211 others on whom certain data were missing at the time these values were calculated are excluded from the Seattle figures for this table only.

[b]Median of eight item-scale correlations (corrected for overlap).

in the range of 0.17 to 0.35; the eight-item summary scale correlated 0.40 with education. The two items rejected on the basis of the factor analysis correlated only 0.02 and 0.05 with education; this result is further reason to question their validity as measures of consumer knowledgeability regarding medical care services. In addition to the relationship with education, the regression analyses presented in Table 6 indicate a weak (but significant) negative association between the consumer sophistication summary scale and the inverse of the number of physician visits during the prior year; this relationship accords with a priori expectations for a valid measure.

Other correlations, which should be insignificant or very low according to the validity hypotheses, tended to conform to the predicted pattern. Although 7 of the 16 correlations between individual items and the general and mental health measures were significant, none exceeded 0.06 in absolute magnitude, and the direction of significant correlations was not consistent. Similar results obtained for the correlations between individual items and the three response set measures; only 8 of 24 correlations were significant, and all were very low (0.11 or lower). Twenty of 32 correlations between items and the four measures of

Table 5

Summary of Validity Coefficients for Eight Consumer Sophistication Items and the Summary Scale

Validity Variables	Items				
	Significance	High	Median	Low	Scale
Education	8/8[a]	.35*	.19*	.17*	.40*
Current Health	2/8	.06*	.02	.00	.02
Mental Health	5/8	.06*	.03	-.04*	.02
Response Sets					
Acquiescence	3/8	.05*	.02	-.06*	.03
Opposition Set	1/8	.01	-.02	-.06*	-.03
Social Desirability	4/8	.01	-.04*	-.11*	-.08*
Beliefs/Attitudes					
Provider Control Over Health Outcomes	6/8	-.15*	-.07*	-.03	-.14*
Personal Control Over Health Outcomes	6/8	-.19*	-.05*	-.01	-.17*
Attitude Toward Going to the Doctor	3/8	-.04*	.01	.00	-.02
Perceived Quality of Care	5/8	-.12*	-.03	-.01	-.09*

[a]Read as follows: 8 correlations were significant in 8 tests.

*$p < 0.01$, two-tailed test.

beliefs and attitudes were significant. All significant correlations were negative and all were low in magnitude (0.04 to 0.19).

The low magnitude of correlations with variables other than education suggests that the eight items and the summary scale distinguish the consumer sophistication construct from beliefs and attitudes regarding doctors and medical care services. However, the consistent negative and significant correlations with the belief and attitudes measures suggest that consumers who tend to be more knowledgeable regarding medical care services also tend to view doctors and their services less favorably. It is also possible that medical sophistication is unrelated to consumer beliefs and attitudes, but that scores computed from the medical sophistication items used here are somewhat biased by attitudes. If so, the data indicate that the bias is slight.

Table 6

Summary of Standardized Coefficients for Consumer Sophistication Items and Scale, Regressed on Age, Education, Race, Sex, and Use of Services, All Sites Combined

Items/Scale	Age	Education	Race[a]	Sex[b]	Physician Visits (inverse)	Physician Visits (dichotomous)
Unnecessary surgery	.047**	.223**	-.079**	-.026	.026	.010
Another opinion	.093**	.135**	-.112**	.040*	.008	.009
Emotional causes	-.040*	.242**	-.183**	.134**	.008	-.018
Medicine prices	.175**	.161**	-.084**	.022	.009	.008
Hospital privileges	.071**	.171**	-.026	.075**	.024	-.012
License renewals	.069**	.296**	-.060**	-.046**	-.017	-.003
Lack of cures	.111**	.161**	.012	.004	.050**	.006
Different treatments	.038*	.146**	-.034*	.022	.023	.013
Consumer Sophistication Scale	.132**	.358**	-.123**	.049**	.034*	.003

[a]Scored 1 = white; 2 = other.

[b]Scored 1 = male; 2 = female.

*$p < .05$.

**$p < .01$.

Group Differences

In addition to increases in consumer sophistication scores with higher levels of education, the summary scale also identified differences in scores for groups differing in age, race, and sex (see Table 6). Consistent with our expectations, older persons and women scored higher on the summary scale and nonwhite persons scored lower.

IV. DISCUSSION

RELIABILITY AND VALIDITY OF THE SCALE

Internal-consistency estimates suggest that the eight-item summary scale is sufficiently reliable to identify group differences in consumer sophistication. Interpretation of group differences in sophistication using individual item scores is a more questionable procedure; one is likely to miss some interesting group differences because of low item reliability.

Analyses of validity generally support interpretation of both the items and the scale as measures of consumer sophistication. The significant and positive correlation between educational level and the items and scale gave evidence of validity, as did the pattern of correlation with other variables. Small correlations between the items and health measures occurred despite the use of very similar item stems and response choices to measure beliefs and health ratings. Thus, we have ruled out, for practical purposes, a major threat to the validity of the consumer sophistication items and the summary scale, namely bias due to measured sophistication's merely reflecting attitudes toward medical care providers and services. We feared that persons holding negative attitudes about doctors would tend to answer certain items correctly (e.g., some operations are not necessary) regardless of whether they actually knew the correct answer; fortunately this fear proved unfounded. The low but significant negative correlations between consumer sophistication and attitudes toward care may reflect a "true" negative association between these constructs, rather than a validity problem. People who are more informed about the medical care system may tend to be more critical of providers and services.

It could be argued that some consumer-sophistication items are more valid than others. In manifest content, some items appear vague. For example, what is the meaning of "checked" in the item stating that doctors are checked every few years? Other items seem to confound knowledge and attitude. For example, persons with a negative attitude toward medical care may agree with the question about unnecessary surgery because they are skeptical in general rather than because they are informed. Some may argue that any rational person who had doubts about a physician's opinion should seek another. However, our psychometric analysis does *not* support this line of argument. The items included in the multi-item scale passed internal consistency checks, i.e., they are all positively interrelated. Further, they have the same pattern of interrelationships with validity variables. For these reasons,

we conclude that the eight items measure one concept (consumer knowledgeability) to about the same extent. Because of the interrelationships among the items, one must either accept the validity of all eight items in the summary scale or reject all eight.

Any conclusions about the validity of these consumer sophistication items and scale must remain tentative until additional validity studies can be performed. These include ascertaining whether sophistication as we have measured it predicts the appropriateness of consumer decision-making in the medical marketplace (e.g., selection of an appropriate specialist), the appropriateness of utilization based on lists of symptoms (Aday and Andersen, 1975), the timeliness with which care is sought, or the acquisition of additional information by seeking a second opinion.

RESEARCH IMPLICATIONS OF THE SOPHISTICATION SCALE

One reason for developing a reliable measure of sophistication was to test two hypotheses: (1) sophistication affects the use of certain services directly; (2) sophistication interacts with cost sharing in affecting utilization. If physicians do have substantial, unexploited abilities to induce demand, their ability to do so should vary with the knowledgeability of the consumer, because it is precisely the consumer's alleged lack of knowledge that is said to give rise to induced demand. Hence, under the induced demand hypothesis, the responsiveness of utilization to variation in cost sharing should increase as the level of knowledge declines. Research testing this hypothesis is currently in progress, and the results will be reported at a later date. The sophistication scale may also prove helpful in explaining the choice of provider, the obtaining of second opinions, and the timeliness with which care is sought.

IMPLICATIONS FOR FINANCING MEDICAL SERVICES

For policy purposes, the absolute level of knowledge is interesting in its own right. The less well-informed the consumer, the better the a priori case for strong regulation of the medical care delivery system; conversely, the better informed the consumer, the stronger the case for price competition or cost sharing. How well informed then is the consumer?

Looking at the absolute levels of correct answers, we can reject extreme points of view—consumers are neither omniscient nor totally

ignorant. Over 90 percent of consumers gave what we viewed as the correct answer to some questions; on other questions only a small minority gave the correct answer, with many "Don't Know" responses or outright wrong answers.

In the Introduction, we noted that some analysts wish to focus price competition around a choice of provider with little or no role for cost sharing. Others advocate cost sharing at the time of use. Taking some license, we have subdivided the ten sophistication items into those that relate to choice of provider and those that relate to decisions made at the time of use. These groupings are somewhat arbitrary, and, of course, the latter group shades into the former when a patient becomes dissatisfied at the time of use and considers changing providers. Nonetheless, we find these two groupings of interest in thinking about the desirability of competition among organized systems relative to cost sharing.

Competition Among Organized Systems

The first set of items consists of those that seem appropriate to consumers faced with a choice of competing health plan options (e.g., a health maintenance organization), although they are also germane to the choice of physician within the fee-for-service system. These items include:

—"If you have doubts about your own doctor's advice, it's a good idea to get another doctor's opinion." An affirmative answer to Item B (Table 2) by most respondents seems fundamental to any well-functioning market; the worried, skeptical, or dissatisfied consumer must be willing to use alternative providers. Over 90 percent of the respondents indicated agreement. We thus infer that there is a limit to how much physicians could manipulate patients (assuming they wished to), because patients are likely at some point to seek others' opinions.

—"If you have a particular medical problem, there is usually a doctor specially trained to handle it." Item G inquires about the fundamental notion of specialization. An affirmative answer by respondents would again seem necessary for a reasonably well-functioning market, not so much because of any direct link to provider choice, but because if the consumer did not appreciate the notion of specialization, knowledge of provider characteristics would be at a low level indeed. In this case also, most respondents answered the question correctly. (Recall, however, that this item did not correlate well with the eight-item scale, perhaps because so high a fraction answered correctly.)

—"You may be able to tell how good a doctor is by finding out if he is certified by a special board." Following the preceding item about

specialization, Item F probed further by asking about certification. An affirmative answer to this item by most respondents would indicate to us a quite good appreciation of how to make choices within the medical care delivery system. Certified physicians have demonstrated a high degree of skill, and there is some evidence that they deliver higher quality care (Lohr et al., 1980). Most respondents, however, appeared either not to know about certification or else thought it indicated nothing about the physician's skills. We suspect the former; over half the respondents indicated they did not know whether they agreed or disagreed. (Like Item G, however, responses to this item did not correlate well with those in the eight-item scale, and thus the item does not appear to measure general sophistication.)

—"If you have to go into the hospital, your doctor can get you admitted to any hospital you prefer." A negative answer to Item E would imply knowledge of staff privileges; put another way, it would imply awareness that choice of a physician is partially choice of a hospital.[4] Across sites, relatively few consumers knew the correct answer to this question, but the percentage of correct answers was notably higher in Seattle ($p < .01$). This may partly reflect the greater number of hospitals in Seattle; there is only one hospital in Georgetown County and two in Franklin County, and choice of hospital in these situations may appear unconstrained by choice of physician. Nonetheless, only 37 percent of the respondents answered the question correctly in Seattle.

—"Doctors are checked every few years, before their licenses are renewed." Fewer individuals answered Item H correctly than any other, and many more indicated they did not know the answer than was the case for any other item.[5] One could argue that the correct answer to this question has few implications because knowledgeable consumers cannot do anything on their own behalf even if they know the correct answer. We disagree. The consumer who is aware that physicians are not reexamined may take more time to secure information about the provider (e.g., may speak with more friends about their experience), whereas the consumer who believes physicians are reexamined may assume all practicing physicians are equally competent. (Some may argue that respondents were confused by

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[4]In retrospect, the item might better have been worded "...your doctor can admit you to any hospital you prefer." But correct answers to this question correlated with others, as noted above, and so we doubt that rewording would have appreciably changed our results.

[5]The wording of this item might have been better had it read "Doctors are reexamined...." For the same reason as that in the previous footnote we do not believe our results would have changed.

developing recertification programs, but this seems highly unlikely in light of our sample's low level of appreciation of specialty boards).

Reviewing these five items, we conclude that consumers have a modicum of knowledge about the delivery system, but many lack knowledge about certain facts that seem relevant to choosing a regular provider. Moreover, we doubt that increased price competition per se would provide an incentive to learn more about choosing a provider because the consumer currently must choose a provider, and these items seem relevant to that choice.

Cost-Sharing

In contrast to the foregoing five items, the remaining five seem more oriented toward how one utilizes a given provider for a particular problem. Thus, they seem more relevant to cost sharing as a policy instrument than they do to schemes designed to increase price competition among organized groups of providers.

—"Some operations done by surgeons are not really necessary." The magnitude of unnecessary surgery is a controversial subject. Nonetheless, we believe a knowledgeable consumer should be aware of the possibility that an operation could be recommended that would be of little or no benefit. Around half the respondents agreed with Item A, which leaves one in the classic position of deciding whether the glass is half empty or half full.

—"Stomachaches and headaches are hardly ever caused by your emotions." Item C was intended to assess patients' knowledge about psychosomatic illness. We do not argue that it is inappropriate to seek medical help with such symptoms, but in many cases self-treatment seems appropriate. Put another way, patients agreeing with this item are probably more vulnerable to manipulation by unethical providers. But such patients were a small minority—most respondents disagreed with this item.

—"For many illnesses, doctors just don't have any cure." The interpretation of Item I is similar to the preceding one; a person who thinks a physician can cure anything seems like a good mark for a manipulative physician. Somewhat fewer respondents answered this item correctly than in the preceding case, but roughly 60 percent of respondents agreed with the item.

—"Two doctors who are equally good at their jobs may still suggest very different ways of treating the same illness." Those disagreeing with Item J evidently believe there is one proper way to treat an illness, ignoring the legitimate uncertainty that often surrounds the treatment of choice. This particular form of naivete may also make an individual

susceptible to manipulation. There were few, however, who disagreed with this item.

—"A medicine prescribed by a doctor can have very different prices, depending on whether or not it has a brand name." Awareness of generic drugs may prompt a patient to ask a physician about prescribing habits, especially if the patient is not insured for outpatient drugs. Around two-thirds of the respondents agreed with Item D.

The level of knowledge displayed in response to these five items was greater than was displayed for the earlier five. Assuming that the two sets of items represent their content domains equally well (e.g., that they do not differ much in average difficulty), patients appear to be more sophisticated about what a physician might tell them about a particular problem than they are about choosing a physician in the first place. But, as pointed out above, dissatisfaction with a physician's recommendations can promote a search for alternatives, so one cannot ultimately make a sharp distinction between the two sets of items.

POLICY IMPLICATIONS

What policy implications can be derived from these results? We are led to two conclusions. First, we find little or no basis in these results for ruling out a cost-sharing strategy on the basis of consumer sophistication. Of course, we may not have asked the proper questions; some may argue that these items are much too simplistic to detect the knowledge a consumer should possess. Nonetheless, a majority of consumers did correctly answer those items most relevant to decisions about the use of services for a particular problem. That fact does not allow us to conclude that cost sharing will lead to good outcomes, only that these results give no reason to think it will not. Second, if it is deemed desirable to pursue a procompetitive strategy, an effort to increase consumer education seems warranted. This effort could be directed particularly at familiarizing consumers with notions of certification, staff privileges, and other information that seems pertinent to choosing a regular source of care best suited to the particular patient's circumstances.

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